

**State of Utah**

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PUBLIC LANDS POLICY COORDINATION

JOHN HARJA
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RESOURCE DEVELOPMENT COORDINATING COMMITTEE
Public Lands Section

November 28, 2007

Mr. Jason Gipson
US Army Corps of Engineers
533 West 2600 South
Suite 150
Bountiful, Utah 84010

SUBJECT: Public Notice No. SPK-2007-00121
Project No. 07-8597

Dear Mr. Gipson:

The Resource Development Coordinating Committee (RDCC) has reviewed the Army Corps of Engineers (ACOE) Notice of Intent to prepare an Environmental Impact Statement for the Great Salt Lake Minerals (GSLM) Solar Evaporation Ponds Expansion Project within the North Arm and Bear River Bay areas of the Great Salt Lake (GSL). State agencies comment as follows:

Division of Oil, Gas and Mining

This permit will require a revision to the mining and reclamation plan after the 404 permit is issued. Coordination during the EIS process is requested to maximize efforts and minimize conflicts.

Division of Wildlife Resources

Potential impacts to Clyman Bay and Bear River Bay salinity, habitat, and ecology

The GSL has hemispheric importance to migratory waterbirds (waterfowl, shorebirds, and wading birds), as many species use the lake for nesting, feeding, and staging areas. At times, millions of birds may be found on GSL and the surrounding wetland/upland habitat complexes. Because GSL is a dynamic system, with the lake elevation changing seasonally and annually, the

abundance and location of habitats continually change over time. These changes create a continual diversity and continuity of available habitats, such that wildlife will move around GSL to find those habitats, which supply their needs. It is in part because of this habitat diversity that GSL has become critically important to wildlife, with the lake sometimes supporting over half of the worldwide populations of eared grebes, American avocets, snowy plover, California gull and white-faced ibis.

When trying to understand wildlife populations on GSL, the waters and habitats within and surrounding the lake environment must be evaluated in the context of the current lake elevation, along with an understanding of the ever-changing water elevations and precipitation events. Dikes for evaporation ponds effectively constrain the waters of the GSL. The effect is to reduce the extent of the lake's natural littoral zone. In many areas, the natural shore of the GSL has a low gradient bottom and slopes gradually from the shore into the water, creating expansive shallow water environments. Avian use of the GSL waters and habitats can shift greatly with these subtle changes in lake elevation because of the low gradient bottom.

The EIS should analyze whether the presence of evaporation ponds in both Clyman Bay and Bear River Bay may eliminate a large portion of mudflat and shoreline habitat made available as wildlife habitat during these dynamic shifts in lake elevation.

Both birds and evaporation ponds require the same type of habitat (extensive mudflat and shallow littoral zones surrounding GSL). The extent of these areas is limited, given the long-term average of the lake and all of the current development within these areas. Evaporation ponds (GSLM ponds and other companies' ponds) currently cover 118,153 acres. At low lake levels, the salinity concentration increases in the north arm to levels beyond what wildlife and invertebrates can tolerate, which is an environment similar to evaporation ponds. Between the developed ponds and the high salinities of the North Arm, at low lake elevations, the total lake and pond area unsuitable for bird habitat around the lake increases to 480,429 acres. This accounts for 43% of the current total lake and pond surface area, leaving only 57% of the total potential habitat available for bird use. This underscores the tremendous value of the remaining habitat. The creation of additional ponds would remove even more habitat from this already diminished habitat base for waterbirds. The EIS should analyze the cumulative effects of these and other influences on GSL and its avian wildlife. We recommend the ACOE to evaluate the additive nature of such large-scale impacts on birds. The following points should be analyzed under the EIS:

- The effects the project may have on migrating and breeding birds utilizing these habitats at a variety of lake levels and associated salinities.
- The cumulative impacts on GSL from the mineral evaporation pond creation, operation,

and maintenance. The foreseeable future impacts to both Clyman Bay and Bear River Bay from the proposed GSLM project expansion, evaluated in the cumulative context of habitats and waters already lost during the past 40 years of mineral extraction processes.

- Whether the construction, operation, or maintenance of the evaporation ponds affect levels of heavy-metal contaminants such as selenium or mercury (via stirring up lake sediments during construction; flushing of brine/salts from the ponds; etc.)? If so, the potential impacts to resident and migratory waterbirds. Whether the contaminants may enter the water column and then move through the food chain (algae, brine flies, brine shrimp, birds). Within the last 3 years, a food-consumption advisory was issued jointly by the state Department of Health, the Department of Environmental Quality, and the UDWR, regarding high levels of mercury, in particular, in the flesh of 3 duck species (northern shoveler, common goldeneye, and cinnamon teal) inhabiting GSL environments.
- The potential long-term impacts to water quality and salinities associated with the removal of salts from GSL. What are the long-term impacts to water quality, salinities, and the biological values stemming from flushing salts from the ponds in "pulses" into Bear River Bay and with "moving" the salts from Clyman Bay to Bear River Bay? What are the potential impacts to algae, wildlife, brine shrimp populations, and the general ecology of each area?

Wildlife concerns associated with Clyman Bay:

Potential impacts to Gunnison Island nesting birds

The EIS should consider whether the construction process and proximity of the lease to Gunnison Island may disrupt nesting of American white pelicans, California gulls, and peregrine falcons. The island supports: American white pelican (mean of 6,850 breeding pairs over the last 10 years); California gull (10,000 - 20,000 breeding adults), peregrine falcon (one pair); great blue heron (historic breeding). Currently there is a protective provision for a one-mile buffer surrounding the island to minimize disturbance.

The buffer is limited, however, in that it does not take into account large, permanent structures, such as dikes which may increase the likelihood of disruption to nesting colonial species. The current dikes in Clyman Bay are approximately 5 miles away from the island and the proposed dikes would be approximately 3 miles away. The proximity of newly constructed dikes may provide predators, as well as human trespassers, easier access to Gunnison Island. Pelicans are known to be highly susceptible to any disturbance and will, at times, totally abandon nesting sites. Pelicans completely abandoned Hat Island (in the South Arm of the GSL) in the 1960's due to human disturbance, primarily hunting. Gunnison Island holds the third largest

breeding colony for American white pelicans in North America. The protection of this habitat is essential in the permitting decisions, given the known nesting site. Juvenile pelicans also may confuse the proposed evaporation ponds with potential foraging sites and become weakened and trapped within them until they succumb to the elements.

Potential impacts to other wildlife

Snowy plovers, a state sensitive species, are known to use mudflat habitats for nesting, similar to those habitats found along the western shoreline of the GSL. No formal vegetation or wildlife studies have been completed in this area and we request that surveys are conducted to ascertain whether habitats occur in the area and whether or not snowy plovers are present.

Constructing dikes and filling of ponds may eliminate fresh-water springs in the leased area. The precise locations of critical wildlife water sources, if any exist, need to be determined because of the essential role which water sources play in determining potential nesting habitat for snowy plovers. Because insufficient data exists, it is unknown whether the presence of permanent ponds on the western shoreline might impact other wildlife species, such as small mammals and raptors. We recommend surveys be conducted to assess the bird and mammal populations present in Clyman Bay prior to authorization of additional pond construction.

Potential impacts to North Arm salinity, habitat, and ecology

Salinity in the North Arm changed substantially as recently as during the "high water years" of the late 1980's and early 1990's. During this time of rising lake level, GSL ecology and available habitats changed dramatically, highlighting the value of North Arm habitats under conditions of fluctuating water elevations. For example, eared grebes (1-3 million) shifted their staging pattern from the South Arm to the North Arm, commercial brine shrimp harvesters moved to the North Arm to follow the shift in the brine shrimp population from the South Arm to the North Arm, brine fly populations shifted to the North Arm and shorebirds and other wildlife shifted / expanded ranges to the North Arm.

Gunnison Bay is currently open for oil and gas leasing, along with mineral extraction leasing. The potential effects of existing and proposed oil and gas wells, in addition to both existing and proposed mineral leasing by GSLM, should be evaluated to determine how cumulative impacts to wildlife, salinities, and water flow could be expected to influence overall ecology of the North Arm. Also, the removal of salts from the North Arm should be evaluated to forecast potential changes to salinities, brine shrimp, and other wildlife over time and at different lake elevations.

Brine flies are the predominant food item for most migratory shorebirds which visit GSL.

During their life cycle they must anchor to bioherms or stromatolites that form on the lake floor. These calcium carbonate structures appear to be essential to the reproductive life cycle of brine flies and are important to the brine shrimp population. At certain times of the year, brine shrimp sustain themselves by feeding on or near these productive structures. The structures are also essential to what is possibly the largest inland U.S. concentration of wintering common goldeneye. The creation of the causeway increased North Arm salinity that made these bioherms unavailable to brine flies.

However, when GSL elevation increases and the salinity decreases in the North Arm, these structures are again available for use by brine flies. Bioherms are only found in a few areas of the GSL and they have been found within the area of the proposed lease in Clyman Bay. The EIS should consider whether this area of Clyman Bay, if diked as an evaporation pond, will lose its bioherm structures. The bioherms should be mapped to determine if the dikes could be placed to avoid directly or indirectly impacting the bioherms.

Wildlife concerns associated with Bear River Bay and Willard Spur:

Between 1997 and 2001, and again between 2004 and 2006, the UDWR conducted waterbird surveys throughout the GSL to gain an understanding of where different waterbird species were located and determine which habitats the birds were using during different times of the year and during different water elevations. During each of the 8 years from spring through fall, these surveys were conducted either 17 times a year (1997-2001) or 9 times a year (2004-2006). The data from these waterbird surveys is available for review.

Potential impacts to Canada Goose

The south end of Bear River Bay where the expansion is planned has extensive use by molting Canada geese. For example, in 2000, UDWR observed more than 11,500 geese in Bear River Bay. The *Management Plan for the Rocky Mountain Population of Western Canada geese* by the Pacific Flyway Council recognizes Bear River Bay as one of several major molting areas in the Intermountain West. One of the Plan's objectives is to "maintain seasonal breeding, wintering, and molting distributions."

Molting areas are typically characterized as large remote areas, with limited disturbance and essentially no predators. Consequently these molting areas are sensitive to increased human activity, increased accessibility for predators such as foxes, or actions that would reduce the overall size of the area. Canada geese are also long-lived and become attached to traditional areas they use for breeding, wintering, and molting.

Because of the traditional nature of Canada geese and the rarity of suitable areas for

molting on GSL, UDWR recommends the EIS consider the values of the affected area and whether it is capable of being replaced or compensated for. In general, data indicate that at lake elevations below 4,200 ft, there is a correlation of declining goose numbers (breeding and molting) with declining lake elevation. This may mean that goose use of Bear River Bay may become particularly sensitive to the amount of surface water available during drier cycles, and any conversion of the limited amount of flooded area could affect the numbers of Canada geese which otherwise would be using the area. Please see the attached file on Canada geese in Bear River Bay.

Potential impacts to Bear River Bay and Willard Spur salinity, habitat, and ecology

UDWR recommends the EIS consider the potential impacts of this proposed project on water circulation patterns within Bear River Bay and subsequently, vegetation, invertebrate populations, salinity and wildlife. A reduction of surface area (especially during low water years) from diking off portions of the Bear River Bay could affect salinity fluctuations within the bay and may also change water circulation patterns between Willard Spur and Bear River Bay. At a GSL elevation of 4200 feet, the channel connecting the two water bodies may be blocked by dike development.

There is a potential for loss of habitat and habitat fragmentation, thus, affecting resident and migratory waterbird populations. Any salt discharges from the evaporation ponds into the Willard Spur area could dramatically affect habitat for migrating and nesting waterbirds, as well as the vegetation and invertebrate populations that provide a forage base for those birds. For example, sago pondweed is important to many tundra swans during the fall, and alkali bulrush seeds are important to common goldeneye during the winter. UDWR has concerns on the potential indirect impacts to the critical forage of waterfowl.

Due to the remoteness and lack of human disturbance or infrastructure, the entire Bear River Bay and Willard Spur area is used by many other waterbird species. Traditionally, this area has been the center of botulism outbreaks. This may be due to the lack of natural flow currently impeded by the existing dikes. A further decrease in natural flow from this expansion may also increase chances for botulism outbreaks.

Specific wildlife/bird use data from an eight year UDWR Waterbird Survey should be included in this EIS. The UDWR Great Salt Lake Ecosystem Program has been observing the GSL and its wildlife and brine shrimp fishery for over a decade and can provide key information for this EIS. UDWR is available to provide wildlife, habitat, disease and brine shrimp information to the ACOE for this project.

UDWR recommends the EIS give attention to the construction phase of this project.

During the construction of the dikes, there will be a reduced area available for emergent marsh or mudflat depending upon lake elevation, which will likely have impacts on resident and migratory waterbirds. Also, the construction of dikes and filling of ponds may eliminate springs within the leased area that provide habitat and stopover areas for migrating birds and inadvertently provide additional habitat for nesting California gulls, which readily prey upon other nesting birds. Finally, the dike construction may create a channel, thus, reducing the area of open water. We strongly recommend consideration of the potential direct and indirect short-term effects from construction.

Potential impacts to hunting and fishing opportunities

The west Bear River Bay and the Willard Spur areas, in combination, provide extensive values to migratory game birds that use adjacent areas including Bear River Refuge, the private hunting clubs, Harold Crane Wildlife Management Area (WMA) and, to a lesser extent, Ogden Bay WMA, Public Shooting Grounds WMA, and Salt Creek WMA. In years when both west Bear River Bay and the Willard Spur hold water through summer, they provide abundant food as well as rest areas for waterfowl using adjacent areas. The EIS should analyze whether the proposed project may reduce the acreage of fresh water in the bay and affect opportunities for waterfowl hunters in this area and on the above-referenced lands. Reduced forage and foraging area as well as reduced rest area for waterfowl during hunting season can impact opportunities for hunters in these areas as well as the area occupied by the new dikes. A reduction of rest areas or fall habitat for waterfowl may also contribute to premature migration and reduce hunting opportunities.

The Bear River Bay and Willard Spur is an extremely important resource for piscivorous birds including pelicans, cormorants, western grebes, clarks grebes, forsters terns, black terns, Caspian terns, Great blue herons, snowy egrets, and black crowned night herons. These birds exploit this rich resource rather than compete with fisherman at other popular lakes and streams. If this resource is impacted, it may result in thousands of these piscivorous birds moving to hatcheries or lakes and streams and therefore directly impacting anglers and angling revenue.

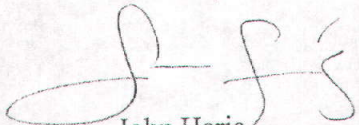
Brine shrimp populations are easily impacted by salinity fluctuations or an increase in salts/contaminant levels created from the flushing of ponds or changes in water circulation patterns. Discharges of wastewater generated during production and solar evaporation could have a profound influence on brine shrimp populations. Possible outcomes could be introduction or sequestration of nutrients typically released into GSL as well as alteration of the salinity and/or ionic composition of GSL. It is feasible that flushing of the ponds could increase contaminant levels which could then be introduced into the algal and brine shrimp populations. This could potentially lead to modifications in the algal food base utilized by brine shrimp. Brine shrimp survival and reproduction patterns may be altered. The quality and survival of brine shrimp cysts

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may change by possible premature deactivation of diapause (hibernation). The cysts available for the initial spring hatch could be decreased thereby directly affecting the brine shrimp population. Decreased cyst quality along with possible contaminant introduction would certainly have impacts on the brine shrimp industry.

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Resource Development Coordinating Committee, Public Lands Section, at the above address, or call the Director, Jonathan G. Jemming, at (801) 537-9023, or Carolyn Wright at (801) 537-9230.

Sincerely,

A handwritten signature in dark ink, appearing to be "J Harja", followed by the word "for" and a small, illegible mark.

John Harja
Director